A Thesis

On Anæsthesia

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On Anaesthesia

In this brief dissertation on Anaesthesia, I shall make no attempt to bring forward anything new, nor, do I flatter myself that I shall add anything to the Knowledge of the profession on a subject which has already been carefully investigated. I have simply endeavoured to collate some few facts, and express them as concisely as possible – drawing largely, of course, from the many published books and magazine articles bearing on the subject

Definition.

Anaesthesia (Gr. a, privative, and αἰσθάνομαι - to feel) signifies a sus-pension, general or partial, of nervous power – literally, an absence of sensation This may be symptomatic of some regularly-progressing disease (as in paralysis, or analgesia) or it may exist temporarily on the exhibition of any substance capable of benumbing and subduing the nervous forces. It is to this artificially-induced Anaesthesia and the application thereof to the relief of pain, that I intend devoting the following pages. Viewed in the light

of the general definition above given, the term anæsthetic would be applied to any substance possessing the property of producing such a condition, and would, therefore, include all the narcotics, stimulants, etc., which are thus endowed - to a greater or less degree; but, by common consent, it has been restricted to those volatile chemical compounds, which act by inhalation. This condition of Anæsthesia may be either general or local, - being general, when all power over the body is lost, and there is more or less complete unconsciousness to external impressions; - local, when only a particular region is thus affected - the brain and the rest of the system remaining as ordinarily.

History

The benumbing of the nerves of sensation by the administration of narcotics has been practised for centuries, and was undoubtedly known to the ancients as the works of Dioscorides, Pliny and Apuleius contain formulæ for their preparation, and describe their effects. There are also certain vague traditions regarding the use in the East of the vapours of Cannabis Indica and Atropa Mandragora, and Theodric, of the 13th century, describes a scent called Spongia Somnifera formed of a strong decoction of these herbs which was employed for the purpose of producing insensibility. (Edin Jour. Med. Sci vol viii), but it is very doubtful if anæsthetic

inhalation was ever employed, save in the imagination of Oriental poets. Local anaesthesia has been frequently employed in various ways, - as pressure of nerve trunks (Ambroise Paré), actual freezing (Dr J Arnott), application of Carbonic Acid (Dr Richardson) etc, etc, - all of which, however, have given but meagre results, as it has been found almost impossible to reduce the sensation of a part low enough to prevent some pain, without destroying its vitality.

The general anaesthetizing by inhalation is essentially a modern discovery; and, like most established facts, has had several claimants for the honour of its origin. In 1795, Richard Pearson, of Birmingham, recommended the inhalation of Sulphuric Ether for the relief of asthma - combining the ether with a decoction of Cicuta (Duncan's Annals of Medicine, 1796, vol I), as did also Dr Crowther subsequently. In 1800, Sir Humphrey Davy, in his "Researches concerning Nitrous Oxide", expressed a belief that this substance might be used advantageously in surgical operations, as it seemed capable of destroying pain; so that to him is due the credit of first directing attention to general anaesthesia, though it was a long time before his suggestion was acted upon. The anaesthetic qualities of ether were referred to in 1822 by Godman, in 1832 by Mitchell, and by Prof. Lond. Jackson and

Wood and Bache in 1833 The first public application for the relief of pain in surgical practice seems to have been made at the Massachusetts General Hospital, in Boston, Oct. 16. 1846, – being administered by Dr. W. T. G. Morton, of that city, to a patient from whom Dr. Warren removed a tumour in the neck. Its employment on this occasion was at the request of Dr. Morton, who had previously used it in dental operations. Consequent on the success attending this exhibition its use spread rapidly, notwithstanding the fact that a patent was granted Dr Morton, on the 12th Nov. for its sole employment – the United States. In the January following appeared a new claimant, Dr. Chas. T. Jackson, of that city also, who declared that it was at his suggestion Dr. Morton was induced to use it; and to pacify him, he was allowed a share in the patent. At about the same time, Mr. Horace Wells, of Hartford, Conn., published a pamphlet in which he stated that he had used Nitrous Oxide in dental operations as early as 1844, that he mentioned his discovery to the Faculty of Harvard College, as well as to several medical men of Boston, including Drs. Morton and Jackson, and that he made a trial before the Faculty, which only failed through

want of proper management. Also, that he had had considerable conversation with a Dr Marcy regarding the respective merits of Nitrous Oxide and Ether, and that in November, 1844, an operation was performed in Dr Marcy's office - the patient being under the influence of ether - which substance, however, seemed to them not equal to Nitrous Oxide. This was confirmed by an affidavit of Dr Marcy, before the Mayor of Hartford. Other affidavits were also produced, not only from medical men who had conversed with Mr. Wells in 1844, on the subject, but also from parties who in the same year, had been the subject of dental operations by him, while under the influence of this gas. The priority of using anaesthetics may therefore be justly conceded to Mr. Wells, as the priority of suggesting it to Sir Humphrey Davy, while Dr Morton's operations brought it prominently before the profession. (See pamphlet on the History of the Discovery of the Application of Nitrous Oxide Gas, Ether and other Vapours to Surgical Operations. Hartford, 1847. Also Littell's Living Age. vol. XVI p. 529, and vol XVII, pp 491-565.) The news of this discovery was conveyed to England in a letter from Dr Bigelow, of Boston to Dr Francis Boott, and no time was lost in investigating its merits. The eminent surgeon Mr. Liston performed the first operation there - (an amputation of the thigh)

under the influence of ether, with the best success, on Dec 21st 1846.

In 1832. Chloroform was discovered in Europe by Dumas and Soubeiran of France, and Liebig of Germany; and also, about the same time, by Mr. Saml Guthrie, of Sackett's Harbour, N.Y. but its correct composition was only ascertained in France some two years later. In November, 1847, at the suggestion of Mr. Waldie, of Liverpool, Dr Simpson made the first trial of its anæsthetic qualities, at the Edinburgh Royal Infirmary - Drs. Miller and Duncan being the operating surgeons. To Dr. Simpson we are indebted for nearly all our present knowledge of the utility of Chloroform. Other substances have been also recommended and used, though none have attained the popularity of ether and chloroform. Among them are Amylene - recommended by Dr Snow in 1847, Jan 11th, before the London Medical Society, and the Bromide of Ethyle and Chloric Ether, much used of late by Mr. Nunneley, of the Leeds Infirmary, and recommended by him to the British Medical Association in 1865.

Anæsthetic Agents.

The list of the agents, which have been, at different times and by different parties employed for the production of anæsthesia, is very

extensive - including chloroform, sulphuric ether, chloric ether and the entire family of ethers, bisulphide of Carbon, Amylene, Benzin, naphtha and various hydro-carbons. Only a few of these, however, have received any general attention, and I need not describe minutely the entire series.

Chloroform - $C_2 H Cl_3$ - a ter-chloride of the compound radicle formyle. The method of preparing this article is to distil in a large retort - Alcohol 1 part, water 2½ and Chloride of Calcium 6 - at a temperature not exceeding 180° fah. When about two thirds have passed into the receiver, the process is to be arrested, and the distillate found to consist of water and chloroform - the latter forming the lowest stratum. It should be separated from the water, shaken with Sulphuric acid to purify it, and re-distilled. Its appearance is that of a colourless, transparent liquid - with a pleasant odour - sp. gr. 1.5. It is very volatile - sp. gr. of vapour 4.2. It is almost insoluble in water, sinking in it in the form of globules, which are of a milky-white colour, if not perfectly pure. In testing the purity of chloroform, notice may first be taken of its density - if less than 1.5, it contains alcohol, ether or aldehyde, and the vapour will be found inflammable. If it reddens litmus paper it contains acid, while if it bleach it, free

chlorine is present. Dunbrains test is as follows: To equal parts by weight of distilled water and Sulphuric Acid (sp. gr. of mixture 1.3) add one drop of chloroform, if pure it will sink in the mixture, but not otherwise. The presence of pyrogenous oils are especially to be guarded against, as they produce cephalalgia, nausea, etc. To detect them, mix the chloroform with an equal volume of chemically pure Sulphuric Acid; - if present it will be coloured brownish-yellow. (Gregory). A simpler test is to place a little chloroform on the hand, which rapidly evaporates - leaving no odour if pure, - but, if those oils be present, they leave their own peculiar acrid smell.

Ether - C_4H_5O - an oxyde of the radical Ethyle. The best method of preparation is that of Brande (See Brande and Taylor's Chemistry p. 550), which is as follows: Sulph. Acid concentrated 6 parts and alcohol (sp. gr. .83) 5 parts are to be mixed, and heated to a temperature of 300°, and then alcohol is to be added through a funnel, gutta-percha, in such a manner that the bulk shall remain unchanged, and the temperature maintained at 270°. If the temperature be allowed to fall below 284°, little else than unchanged alcohol passes over, if raised above 302° oil of wine, olefiant gas, and other products are generated. The chemical changes that occur have been variously described, but the weight

of authority confirms the original idea of Mitscherlich, viz. that under certain conditions, alcohol is simply resolved into ether and water by a catalytic action of Sulphuric Acid. Ether of commerce generally contains alcohol and water. It may be purified by agitating with milk of lime, and then distilling over a waterbath with gentle heat. The first distillate is to be shaken with water to separate the alcohol, and the resulting aqueous ether dehydrated by distilling off Chloride of Calcium. Ether is a highly volatile, transparent colourless, though by no means inodourous fluid. Density varies with temperature, but is commonly observed at .72. The vapour is inflammable sp. gr. 2.6. Its evaporation produces the most intense cold, though anhydrous ether does not of itself freeze.

Nitrous Oxide - $N O$ - Laughing Gas. Protoxide of Nitrogen, though discovered in 1776, was not fully understood until the researches of Davy in 1800. It is prepared by heating in a retort pure crystals of Nitrate of Ammonia at a temperature not exceeding 400°. The salt is entirely resolved into water and Nitrous Oxide. ($N H_4 O, N O_5 = 2 N O + 4 H O$) one oz producing nearly two gallons of gas. It is colourless, with a very slight odour and taste. sp. gr. 1.5. In its properties it resembles Oxygen, though to a limited degree,

The other substances are so numerous, and at the same time so sparingly employed, that it would be an unnecessary occupation of space for me to proceed with their description in detail. Those I have given are the most important, and the only ones that have received the favourable notice of the profession in general.

Relative Value of the different Agents.

Of the large number of agents employed for the purpose of inducing Anæsthesia, two only have attained to general popularity - ether and chloroform. Nitrous Oxide, which first suggested the idea to the mind of Sir Humphrey Davy was also the first really employed, and its use has continued to the present day, though only to a limited extent and mainly in the practice of dentistry, and for operations in minor surgery. In order for its administration, the full consent and assistance of the patient is necessary, and very often this cannot be obtained. The duration of its action is uncertain, and in attempting any operation requiring time, it might fail the surgeon in the most critical period. I have seen it used successfully often, but it has been in operations which could be rapidly performed. In some forms of disease, especially in a tendency to Apoplexy, it has caused serious results. But, even were it perfectly harmless, its inconvenient bulk, and its sometimes uncertain effect, would be sufficient to prevent its

extensive employment. Amylene was the favourite of the late Dr Snow, but it has caused death several times. Bromide of Ethyle and Chloric Ether used and recommended by Dr. Nunnely are not much known to the profession, but they can be obtained at a cost little, if any, above that of Chloroform, and are deserving of some attention. But speaking of Anaesthetics, at once suggests to the mind the use of ether or of chloroform, and these two divide the support of the profession. Ether has this argument in its favour, that, no matter how carelessly it may have been employed, instances of death following its use are very rare. But, on the other hand, it takes considerable time, and a large quantity of material to bring the system under its influence, and its odour can be detected in the breath long after the administration has ceased, shewing a duration of action much longer than is required. The odour is also very disagreeable, and acts as an irritant to the mucous lining of the respiratory organs, and there is generally superadded an unpleasant excitement. Chloroform acts speedily, the period of excitement is brief, and sometimes unnoticed, the quantity required is generally small, and its effect passes away immediate upon the suspension of inhalation,—at the same time its agreeable odour renders it pleasant to the patient. And

though the objection is advanced, that its very rapidity of action forbids a correct estimate of its power in each individual case.- and that, moreover, fatal results have been known to follow, yet the best surgeons, especially in Europe, now give it the preference. Quite a number in the United States have combined the two- in the proportion of one part chloroform to three ether, with an apparently good effect. But, I am inclined to the belief that very little danger follows the use of chloroform,- provided a pure article be given to a healthy person, and care taken in its administration. The majority of cases of death are no doubt the result of carelessness- the subject becoming asphyxiated from the utter exclusion of atmospheric air. The only cause for wonder is, that accidents do not oftener occur, when we consider the carelessness with which it is used- especially in hospitals, where the administration is left to an assistant, generally more anxious to witness the operation than attend to his own duty. Chloroform contains not an atom of Oxygen, and without this life soon becomes extinct, even though the gas respired be perfectly inert. In ether, there is some little oxygen, and inattention in its use will not cause so much mischief. Ether may, therefore, be more satisfactorily employed by the inexperienced, or in cases where a trustworthy assistant cannot be obtained. "But there is no reason," say

the late Dr Hall, "why the practised surgeon should confine himself to the weaker and more inconvenient article." And I may add, there is no reason why even the inexperienced should thus hamper himself, if he only possesses confidence, and pays due attention to the case. The number of deaths caused by anæsthetics, up to December, 1859, were computed by Dr. Chapman at 74. (See Westminster Review, Jan. 1860). Of these 68 were from chloroform, two from ether, two from amylene, one from a mixture of chloroform and ether, and one from a mixture of chloroform and alcohol. Dr. C. calculated the number of cases in which anæsthetics had been inhaled, up to that date, at 1,200,000 – making the mortality about 1 in 16,216.

Administration of Anæsthetics.

The methods of administering anæsthetic agents is as diversified as the style of handling the scalpel; but there are certain principles connected therewith which require to be followed, and to illustrate those I shall describe the mode I have myself adopted. A piece of folded lint, or a sponge, is saturated with chloroform, and applied to within about three inches of the patient's nose; after the lapse of some thirty seconds, it is brought close (but never allowed to touch) and a porous towel laid single over the hand of the

administrator, to prevent the escape of vapour. The chief points are:- not to give it too suddenly, not to bar the admission of air,- and, while under its influence, not to raise the patient suddenly off the table, as from its sedative action on the heart, fatal syncope might ensue. There are any number of articles manufactured to assist the process of inhalation - such as Gibsons Mask, Snows Inhaler, etc., etc., all of which are very good, but unnecessary. The plan lately recommended by Prof. Simpson is - to spread a handkerchief single folded over the face, and allow the liquid to fall drop by drop upon it, near the mouth and nose. The quantity required is said to be less than by any other method. A little olive oil, however, should be applied about the mouth to prevent cutaneous irritation. As soon as the patient is fully under its influence, it can be given more sparingly - the operator watching for any untoward symptoms, and the moment they appear discontinuing its use. Should it have been completely suspended at any time during the operation and it becomes necessary again to resort to it, it should be given cautiously, as the already benumbed heart may not be able to resist too sudden an exhibition of the vapour; and, besides, a less quantity will be generally sufficient to produce the desired result. The rule laid down by Dr. Valentine Mott, was, that

"To exhibit anaesthetic vapours too suddenly is to incur the danger of asphyxia; but, to exhibit them too slowly, inconvenience the surgeon and prolongs inconveniently the stage of excitement - requires a greater quantity of material, and renders spasmodic action of the glottis more likely to occur." (See paper on the use of Anaesthetics, in Surg. Gen. Hammond's Military Essays.) In the use of ether, a hollow sponge saturated with the liquid, and covered with a towel may be applied directly to the nose; - sufficient air will be admitted through the meshes of the sponge to prevent asphyxia. No matter what agent is used, some amount of air is required, for the presence of Oxygen is necessary to support life; and the very small portion of this element in ether, especially as it is in the form of a chemical combination, can exercise but little life-sustaining power, while its entire absence in chloroform renders the presence of air still more important in the exhibition of that agent. It is always advisable not to anaesthetize within two hours after a full meal - in order to avoid the inconvenience of a fit of vomiting.

Phenomena and Pathogenesis of Anaesthesia.

The symptoms produced by the exhibition of anaesthetic agents were carefully investigated by Dr. Snow. (See Med. Gaz. vol. xii - 1854), and I cannot do better than draw largely from him. He divides their action into five degrees

The 1st he describes as a kind of inebriation with consciousness unimpaired, but sensation somewhat blunted, and "morbid increase of the common sensibility is in many cases relieved". — 2d The mental functions are impaired, though not suspended, and consciousness is confused. This degree appears "analagous to certain states of the patient in hysteria and cerebral concussion, and corresponds with that condition of an inebriated person, which the law denominates drunk and incapable." — 3d The mental faculties have completely succumbed, voluntary motion, and muscular contractions frequently occur. "Complete anaesthesia is not a necessary part of this degree." 4th There is now such complete insensibility that the most severe injuries produce no impression, and reflex action cannot be excited. The involuntary fibres still retain their contractility to some extent, at least. The 5th degree "is the commencement of dying."

The sensations experienced by a patient under anaesthetic influence, and the physical symptoms presented, may be thus summed up. There is at first a slight degree of intoxication, evidenced by bursts of laughter, hysterics, senseless talking, etc. As the vapour obtains control over the system, there is experienced a general warmth, increased muscular power, and excitement; then confused ideas, tinnitus aurium, flashes of light, followed by loss of sensation

and voluntary power, and then by total anæsthesia. In general, the face is a little flushed, veins turgid, eyes suffused and pupils dilated. The pulse is at first increased, but becomes lowered when the system is completely under control, as does also the respiration. The temperature may remain unchanged, unless the influence be long-continued, and then it becomes slightly reduced. The effects disappear almost immediately after the inhalation is discontinued, and the patient returns to perfect consciousness, with seldom any unpleasant sequelæ.

A careful observation of the phenomena accompanying the exhibition of these anæsthetic vapours, will show that they belong, to some extent at least, to the class of Narcotics, of which opium, cannabis, etc, are examples. It first shows its influence on the mental powers - beginning with slight stimulation, which increases - the imagination becomes more active - fear is banished - thought is active, and action prompt. This is followed by a disturbed or perverted state of the faculties, all the varieties of intoxication may be displayed, according to the character of the patient - laughing, crying - sullen, or furious - the mind still active, but its activity perverted. Then comes a suspension, - the patient is becoming narcotized - he is in a partial sleep, with his mind dormant, but still there is some consciousness to pain, though he cannot tell what it is that annoys

him. The reflex movements are still properly performed. But this soon passes into a profound sleep, in which the nerves have lost the power of receiving and communicating impressions, - the brain the power of recognizing them. The reflex power of the spinal cord is benumbed - and thus all muscular contractility is lost and no irritation can excite motion. But simply classing anaesthetics as narcotics, does not, to my mind, completely account for all the phenomena they produce. The action of a narcotic is not so transitory as that of an anaesthetic - it does not declare itself so soon, but continues much longer; - and its effects are also long-lasting, - especially the stage of depression that follows the unconsciousness. Administer a narcotic sufficiently powerful to produce complete insensibility to the pain of an operation, if that were possible, and the result would almost certainly be fatal. But the most perfect anaesthesia produced by chloroform is recovered from very soon after the inhalation of the vapour is discontinued. We must look, then, for something more in anaesthesia than simply narcosis. And, I believe we shall find it in the state of partial asphyxia which the inhalation of a gas will produce, by interfering with the proper aration of the blood. The introduction of anaesthetic vapours into the lungs necessarily precludes the free entrance of the

oxygen of the atmosphere; the blood begins to lose its arterial character, and to become more and more venous; the brain, supplies by this blood partially deprived of its oxygen, which is the great stimulator of nervous activity, grows torpid, and the first stage of asphyxia - insensibility - is being rapidly induced. But, at the same time, some of the vapour has passed through the thin walls of the pulmonary vesicles into the capillaries, and the blood which supplies the nerve centres is not only venous, but is also impregnated with the narcotic properties of the gas it has absorbed, - and partial narcosis as well as partial asphyxia is the result. Now, cease the inhalation - the blood becomes fully oxygenated, and the asphyxia passes off, - while the slight narcosis which has been produced soon follows, or, at most, gives but little indication of its presence. To have carried either asphyxia or narcosis to such a degree as would preserve complete anæsthesia for any length of time, would have been simply to destroy the patient; but a combination of the two states, each to a limited extent, produces the required result rapidly, with comparative safety, and without entailing unpleasant sequela. This seems to me the simplest method of accounting for the accomplishment of anæsthesia by the inhalation of vapours; and I now hasten to indicate some of those pathological conditions in which these agents should not be exhibited.

Contra-Indications

Foremost among these is fatty degeneration of the heart. Here the muscular power of this organ is, at best, greatly limited, and the added depression accompanying anæsthesia might be sufficient to arrest its action completely, and fatal syncope result. Any other diseased condition of the heart would also be a caution against its administration, though in a less degree. Another prominent contra-indication is that pathological state which may be termed Toxæmia. When the blood has in any manner become poisoned, or degenerated, to cut off its supply of oxygen, upon which is rested its main dependance for a state of health, is to run the risk of fatal coma, in all probability accompanied with the horrors of epileptiform convulsions. Any description of brain disease, would give a similar caution. In such a case, the purest blood is necessary for the supply of that organ, and it is perfectly plain that the result of anæsthesia would be the same as in a healthy brain were supplied with blood, which, poisoned by disease, had superadded a deficient supply of oxygen, and the influence of a narcotic agent.

Fatal Symptoms.

Death may follow anæsthetizing, by the induction of coma, asphyxia,

a syncope and the attending symptoms are indicative of these three great pathological states. When from Coma,- the patient is heard to breathe stertorously- lividity of the face, with convulsions more or less marked, ensue. The heart beats on till the last moment; and the death is unquestionably the consequence of the supply of impure and narcotized blood to the nervous centres. This, as is evident, will be most liable to occur in the subjects of toxæmia. In Asphyxia, there are the usual symptoms of lividity, jugular distention, gasping for breath, and speedy cessation of the heart's action. This results from the inattention of the operator in not admitting sufficient air to maintain respiration, and is the cause of the majority of deaths attending Anæsthesia. The symptoms of asphyxia and coma are not so distinct from each other as they are from Syncope. Here, after a few inspirations, the patient suddenly becomes pale- faints- the pulse beats irregularly for a second or two- then ceases, though respiration may continue for a brief space longer. This occurs in individuals depressed by emotion or physical debility, or affected with heart disease, especially fatty degeneration. In such a case, it has been recommended to give a little stimulant previous to the operation, but the risk to be run should be clearly understood.

Antidotal Treatment-

When symptoms arise showing that an overdose of chloroform has been

administered, the indications of treatment are – 1st To establish respiration, artificial or natural, so as to empty the lungs of the vapour (which from its density has sought and filled the most dependent of the bronchial tubes) and to arrest the oxygenation of the blood; 2d To stimulate the heart's action and maintain the circulation. To the accomplishment of these aims, the vapour must be at once removed, and fresh air admitted by opening the doors and windows, and clearing the bystanders from the vicinity; all constrictions and coverings should be removed from the throat and chest, and the tongue drawn out of the mouth. Friction may be applied to the extremities, a little brandy rubbed inside the mouth – ammonia applied to the nostrils – water sprinkled on the face and chest – and smart slaps given to the cutaneous surface, especially over the region of the diaphragm. Electricity, if convenient, is also a valuable remedy – applied over the heart and diaphragm. While some of these means are being employed, artificial respiration should be kept up, by steady compression and relaxation of the thoracic walls, or, still better, by the method recommended by Dr. Sylvester, for the restoration of animation in asphyxia.

Anaesthesia in Surgery.

The introduction of anaesthesia into the practice of surgery has been

undoubtedly one of the greatest of physical blessings conferred upon humanity — relieving, as it does, the patient from the sensation of pain, and the surgeon from the distress of causing it — as well as freeing him from that embarrassment which would frequently attend him did he know that every movement of his knife was causing intense agony. It is in surgery especially that the beneficial effects of anaesthesia have been evidenced. Protracted and careful examinations can now be made in many cases of disease as well as injury, when otherwise the intense pain of manipulation would have interposed an almost insuperable bar; and thus correct diagnosis is facilitated, and treatment rendered more successful — as in many cases of fractures, dislocations, calculi, etc. Delicate operations may with ease be performed, where perfect quiet is demanded on the part of the patient, which can seldom be afforded by direct exercise of the will, as in dissections of nerves, and especially in ophthalmic surgery. Patients will now apply much earlier for relief in surgical cases, — the dread of the knife having often induced them to procrastinate until too late. Operations can now be performed successfully after injuries or long-continued disease, which would before have been hazardous from the depressed and enfeebled state of the patient. And, finally, from the muscular relaxation which follows a complete dose, the

reduction of dislocations, fractures, hernia, etc, is now rendered comparatively easy.

It has, however, been presumed by some that the use of these agents has increased the rate of mortality after operations; and Dr. J. Arnott has published statistics, which, if correct, give an increased mortality of 12 per cent in amputations, and 28 per cent in lithotomy. But I doubt not this objection is more apparent than real — from the fact that operations are now often performed in cases that give but little promise of success. In days of old, it was considered a serious matter to perform a capital operation, and the conscientious surgeon hesitated to expose his patient to the unavoidable suffering, unless there were good prospects of a favorable issue; whereas, now, no such objection exists, and in his anxiety to give the patient the benefit of his only chance for life — no matter how infinitessimal it may be — the surgeon often operates in those extreme cases which would previously have been left without any attempt at relief.

I have already detailed the best methods of anaesthetizing, and it is therefore unnecessary for me to enter upon that subject in this connection. The duty should devolve upon an assistant in whose ability the surgeon has full confidence, so that he may not be embarrassed by any doubts of

its correct administration. Care should be taken to protect the abdomen from pressure, in order that the respiration, which is mainly diaphragmatic, should not be interfered with. It is, of course, quite unnecessary in all cases, to anæsthetize to the same extent. In major operations,- in hernia, the reduction of dislocations, etc.,- it should be carried far enough to produce muscular paralysis as well as unconsciousness; but, for the removal of small tumours, and minor operations generally, it will be sufficient to provide simply for insensibility to pain, without especial regard to muscular relaxation.

The advisability of administering anæsthetics in operations following severe injuries, during the continuance of the shock, has been doubted by some, on the ground that it lowers the already depressed vital powers, while on the other hand the pain of the operation would serve as a stimulant. But the weight of authority goes to show that pain in surgical practice always retards success, and endangers the patient; and if anæsthetics do lower the vital energies, still more will the pain and consequent nervous shock. Says Prof. Erichsen, - "The pain of an operation performed soon after the occurrence of a severe injury, appears to act most injuriously, by inflicting a second shock upon the system before perhaps it has fairly recovered

from the first, and it is in preventing this that chloroform is of such inestimable advantage in these cases." All eminent surgeons adduce a similar testimony, and the objection is thus easily disproved of.

Anaesthesia in Midwifery

The most prominent advocates of the introduction of anaesthesia in obstetrical practice are Profs. Simpson of Edinburgh, and Channing of Boston, and from them especially — as well as from others — it receives high and unqualified praise. Indeed, Dr Simpson, in his enthusiasm, expresses himself as convinced of the probability of anaesthesia in future becoming completely confined to obstetric practice. To this gentleman is due the credit — (if it be a credit) of being the first to originate the practice; and it is not, therefore, so much to be wondered at, that he should bestow on it the love of a mother for her first-born. The following is a brief synopsis of its early history. On the 19th January, 1847, Prof. Simpson first used ether in a case of version (Provincial Medical Gazette, 1847) On the 25th Mr. Key, at St. Bartholomew's Hospital, in a case of caesarian section. In France, in January, 1847, Fournier Deschamps employed it in a forceps case. In America, it was introduced by Channing, on the 5th of March,

also in a forceps case. (Boston Medical Journal, 1847) Chloroform was first employed by Simpson, for the same purpose, on the 8th of November 1847.

In regard to its utility in this branch of practice, I question if a true homeopathist would be able to speak from personal experience, unless as regards surgical obstetrics. Its advocates are nearly all of the Allopathic school, and, with the limited therapeutical knowledge possessed by them, the introduction of anaesthesia was doubtless a boon not to be despised. Among the beneficial results which they claim for it are the following. That, in addition to preserving the mother from the pain always incident to parturition, her strength may be preserved unimpaired, when the labour is protracted or severe. That, in instrumental labour, assistance can be afforded with greater ease to the accoucheur and less suffering to the mother. That rigidity of the os uteri and vagina may be relieved, and the exit of the child facilitated in these cases. That one of the worst complications of labour, puerperal convulsions, may be kept in abeyance or reduced in violence. That cases of doubt in diagnosis may be more correctly solved. That convalescence is greatly assisted, and subsequent

danger lessened - With regard to the practice of inducing anæsthesia as a mere matter of routine in natural labours, which the first of these hypotheses would seem to inculcate, I doubt if it has many advocates at present: and it is certainly uncalled for, and unjustifiable. That there is some risk, no one will deny, and it is no mark of prudence to incur this risk for the purpose of overcoming physiological inconveniences, which in natural labour never have an unpleasant effect. In operative midwifery, where the mother has to be exposed to additional pain and suffering, it is unquestionably demanded, but, under all other conditions, where allopathic ignorance recommends it as an almost certain panacea, the educated and scientific practitioner is never at a loss for means which, applied according to the only known law of cure, will speedily have a beneficial effect, without possible danger or inconvenience to either mother or child. Even among the leading allopathic obstetricians, however, there is far from being a unanimity of opinion, and with Simpson and Channing on one side, and Ramsbotham and Meigs on the other, we have a clear case of the disagreement of doctors.

It is unnecessary for me to waste further space on this subject, but I may be allowed, before concluding, to advert briefly to the induction of

Anaesthesia in Medicine

It was in the practice of medicine proper that the inhalation of vapours was first employed and many philosophers and physicians made experiments with various gases to determine their value in disease, as well as their effect in health. (See Philada. Transactions 1774 vol X IX). Dr Pearson, of Birmingham first employed ether for relief in pulmonary complaints, for an account of which, see Duncan's Annals of Medicine 1796. vol I; and in 1815. Nysten (Dictionary of Medical Science vol XIII) speaks of the vapour of ether as familiarly known for the relief of the pain of colic as well as pulmonary complaints. Here, as in obstetrics, anaesthesia has been confined to the practice of Allopathic physicians, and by them it is used chiefly as a narcotic and antispasmodic. In this manner they recommend it for the relief it affords in the severe pain attending toothache, neuralgia, the passage of calculi, etc., and in the treatment of chorea, hysteria and convulsions generally.

Fortunately for a small portion of the human race, we, who claim to have our minds lighted by the beams of that rising sun which is now breaking in upon the thick darkness, and scattering the accumulated mists of centuries of ignorance and bigotry which have shrouded the medical

would stand in but little need of these accessory measures for the relief of our patients. With the shadows not yet all banished,—with our Materia Medica incomplete, and our knowledge far from infallible— there may come cases at very long intervals, where our resources may not be known or appreciated, and we may be compelled to call in unscientific measures for temporary aid. But firm in the belief that no permanent cure can be effected save through the instrumentality of correct homœopathic therapia, and anxious to add to the knowledge already possessed by the profession, and increase the resources on which to draw for the relief of the sick, we will diligently search out those mysteries of nature which yet remain undiscovered, and as success always follows perseverance, the time will come when the petty appliances we are now sometimes called on to employ will be laid aside, to be thought of only as curiosities of the past; and with a broad and expansive Materia Medica, educated and scientific physicians will be everywhere found ready to meet and battle with disease, under an unsullied Hahnemannian banner.

But, while we reprobate the general palliative employment of

anæsthesia in physic and midwifery, we cannot but rejoice in its discovery and application in Surgery. The relief of suffering is a noble aim, - and to its accomplishment the physician bends all his energies, - striving for it as the sole object of his existence. And even with the limited knowledge that has so long cursed the profession, these exertions have not been altogether in vain - as the homage of the sick-chamber allows. In disease, we can accomplish this end surely by the administration of remedies, which, while they relieve present suffering will permanently cure. But, in the practice of Surgery we are compelled, for the preservation of life, to perform operations which must of necessity be accompanied with pain, and we cannot but hail with pleasure any measures that will preserve the patient from this additional suffering; - and, while relieving the patient, relieve at the same time the sympathizing surgeon, - make his practice more skilful (and, as a consequence more successful) - because unembarrassed and uncomplicated; - and fix the noble Art of Surgery on a firmer foundation - to be no longer the opprobrium of the Healing Science, but its honoured coadjutor.